

SPECIFICATIONS FOR WORK

SPECIAL PROVISIONS

Contents:

1. Project Description
2. Project Related Contracts
3. Site Inspection
4. Soils Information
5. Engineering, Inspections, and Testing
6. Engineering Interpretations
7. Rejected Work
8. Utilities
9. Construction Safety
10. Construction Limits and Areas of Disturbance
11. Protection of Adjacent Improvements
12. Tree Protection and Preservation
13. Construction Surveys
14. Material Sources and Construction Water
15. Materials Salvage and Disposal
16. Stored Materials
17. Staging and Stockpiling Areas
18. Security
19. Cleanup
20. Access During Construction
21. Construction Traffic Control
22. Sanitary Facilities
23. Record Drawings
24. Proposal Item Descriptions and Estimated Quantities

1. PROJECT DESCRIPTION

The Project involves construction work associated with 2012 Entrance Road Improvements, Threemile WMA, Fish, Wildlife & Parks (FWP) project # 599203, located in Ravalli County, MT as identified in the project drawings. The project generally includes reconditioning the existing roadway surface, culvert installation, importing and crushed gravel placement, and incidentals.

2. PROJECT RELATED CONTACTS

Project contacts are designated as follows:

Owner:	Montana FWP 1420 E. Sixth Ave. PO Box 200701 Helena, MT 59620-0701	Project Representative:	Mark McNearney FWP Project Manager 600 N. Park Ave. Helena, MT 59620-0701 406-841-4009 (wk) 406-431-4033 (cell) 406-841-4004 (fax)
---------------	---	--------------------------------	--

3. SITE INSPECTION

All Bidders should satisfy themselves as to the construction conditions by personal examination of the site described in this document. Bidders are encouraged to make any investigation necessary to assess the nature of the construction and the difficulties to be encountered.

4. SOILS INFORMATION

Geotechnical investigation work has not been done for this Project. It is the responsibility of the Contractor to conduct all investigations and determine the soil type and digging conditions that may be encountered with this Project prior to bid preparation.

5. ENGINEERING, INSPECTIONS, AND TESTING

The Contractor's work will be periodically tested and observed to insure compliance with the Contract Documents. Complete payment will not be made until the Contractor has demonstrated that the work is complete and has been performed as required. If the Engineer detects a discrepancy between the work and the requirements of the Contract Documents at any time, up to and including final inspection, such work will not be completely paid for until the Contractor has corrected the deficiency.

The Engineer will periodically monitor the construction of work to determine if the work is being performed in accordance with the contract requirements. The Engineer does not have the authority or means to control the Contractor's methods of construction. It is, therefore, the Contractor's responsibility to utilize all methods, equipment, manpower, and other means necessary to assure that the work is installed in compliance with the Drawings and Specifications, and laws and regulations applicable to the work. Any discrepancies noted shall be brought to the Contractor's attention, who

shall immediately correct the discrepancy. Failure of the Engineer to detect a discrepancy will not relieve the Contractor of his ultimate responsibility to perform the work as required.

The Contractor shall inspect the work as it is being performed. Any deviation from the Contract requirements shall be immediately corrected. Prior to any scheduled observation by the Engineer, the Contractor shall again inspect the work and certify to the Engineer that he has inspected the work and it meets the requirements of the Contract Documents. All buried work items shall be inspected by the Engineer prior to backfilling, or may not be considered for payment.

The work will be subject to review by the Project Representative. The results of all such observations shall be directed to the Contractor only through the Project Representative.

5.1 Services Provided by the Contractor. The Contractor shall provide the following services:

- a. Any field surveys to establish locations, elevations, and alignments as stipulated on the Plans. FWP reserves the right to set preliminary construction staking for the project. The Contractor is responsible to notify FWP for any construction staking discrepancies.
- b. Preparation and certification of all required shop drawings and submittals as described in the General Conditions.
- c. All tests requiring the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to the Engineer. The laboratory shall be staffed with experienced technicians properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- f. The Contractor shall provide the Engineer with a written schedule indicating dates for specific testing and inspection services to be performed. The schedule shall be updated as required to give the Engineer at least one week's advance notice. The Contractor shall notify the Engineer immediately of any change or shall be subject to pay engineering fees as herein defined.

5.2 Services Provided by the Owner. The Owner shall provide the following services at no cost to the Contractor except as required for retests as defined in the Contract Documents.

- a. The Engineer may check compaction of backfill and surfacing courses using Proctor information supplied by the Contractor. These tests are to determine if compaction requirements are being fulfilled in accordance with the Contract Documents. It is ultimately the responsibility of the Contractor to insure that this level of compaction is constant and met in all locations.

6. ENGINEERING INTERPRETATIONS

Timely engineering decisions on construction activities or results have an important bearing on the Contractor's schedule. When engineering interpretation affects a plan design or specifications change, it should be realized that more than 24 hours may be required to gain the necessary Owner participation in the decision process including time for formal change order preparation as required.

7. REJECTED WORK

Any defective work or nonconforming materials or equipment that may be discovered at any time prior to the expiration of the warranty period, shall be removed and replaced with work or materials which shall conform to the provisions of the Contract Documents. Any material condemned or rejected shall be removed at once from the project site. Failure on the part of the Engineer to condemn or reject bad or inferior work or to note nonconforming materials or equipment on the Contractor's submittals shall not be construed to imply acceptance of such work. The Owner shall reserve and retain all its rights and remedies at law against the Contractor and its Surety for correction of any and all latent defects discovered after the guarantee period.

The Engineer will have the authority to reject work which does not conform to the Contract Documents and will provide the Owner with a list of defective work and nonconforming materials or equipment. The Owner will then promptly provide the Contractor with the list of defective work on nonconforming materials or equipment.

8. UTILITIES

The exact locations of existing underground utilities that may conflict with the work are not precisely known. It shall be the Contractor's responsibility to contact the owners of the respective utilities and arrange for field location services. **One Call Locators, 1-800-424-5555**

8.1 Notification. The Contractor shall contact, in writing, all public and private utility companies that may have utilities that may be encountered during excavation. The notification includes the following information:

- a. The nature of the work that the Contractor will be performing.
- b. The time, date and location that the Contractor will be performing work that may conflict with the utility.
- c. The nature of work that the utility will be required to perform such as moving a power pole, supporting a pole or underground cable, etc.
- d. Requests for field location and identification of utilities.

A copy of the letter of notification shall be provided to the Engineer. During the course of construction, the Contractor shall keep the utility companies notified of any change in schedule or nature of work that differs from the original notification.

8.2 Identification. All utilities that may conflict with the work shall be the Contractor's

responsibility to locate before any excavation is performed. Field markings provided by the utilities shall be preserved by the Contractor until actual excavation commences. All utility locations on the Drawings should be considered approximate and should be verified in the field by the Contractor. The Contractor shall also be responsible for locating all utilities that are not located on the Drawings.

- 8.3 Removal or Relocation of Utilities. All electric power, street lighting, gas, telephone, and television utilities that require relocation will be the responsibility of the utility owner. A request for extending the specified contract time will be considered if utility owners cause delays.
- 8.4 Public Utilities. Water, sewer, storm drainage, and other utilities owned and operated by the public entities shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All such work shall be in accordance with these Specifications, or the Owner's Standard Specifications or written instructions when the work involved is not covered by these Specifications.
- 8.5 Other Utilities. Utilities owned and operated by private individuals, railroads, school districts, associations, or other entities not covered in these Special Provisions shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All work shall be in accordance with the utility owner's directions, or by methods recognized as being the standard of the industry when directions are not given by the owner of the utility.
- 8.6 Damage to Utilities and Private Property. The Contractor shall protect all utilities and private property and shall be solely responsible for any damage resulting from his construction activities. The Contractor shall hold the Owner and Engineer harmless from all actions resulting from his failure to properly protect utilities and private property. All damage to utilities shall be repaired at the Contractor's expense to the full satisfaction of the owner of the damaged utility or property. The Contractor shall provide the Owner with a letter from the owner of the damaged utility or property stating that it has been repaired to the utility owner's full satisfaction.
- 8.7 Structures. The Contractor shall exercise every precaution to prevent damage to existing buildings or structures in the vicinity of his work. In the event of such damages, he shall repair them to the satisfaction of the owner of the damaged structure at no cost to the Owner.
- 8.8 Overhead Utilities. The Contractor shall use extreme caution to avoid a conflict, contact, or damage to overhead utilities, such as power lines, streetlights, telephone lines, television lines, poles, or other appurtenances during the course of construction of this project.

- 8.9 Buried Gas Lines. The Contractor shall provide some means of overhead support for buried gas lines exposed during trenching to prevent rupture in case of trench caving.
- 8.10 Pavement Removal. Where trench excavation or structure excavation requires the removal of curb and gutter, concrete sidewalks, or asphalt or concrete pavement, the pavement or concrete shall be cut in a straight line parallel to the edge of the excavation by use of a spade-bitted air hammer, concrete saw, colter wheel, or similar approved equipment to obtain a straight, square clean break. Pavement cuts shall be 2 feet wider than the actual trench opening.
- 8.11 Survey Markers and Monuments. The Contractor shall use every care and precaution to protect and not disturb any survey marker or monuments, such as those that might be located at lot or block corners, property pins, intersection of street monuments or addition line demarcation. Such protection includes markings with flagged high lath and close supervision. No monuments shall be disturbed without prior approval of the Engineer. Any survey marker or monument disturbed by the Contractor during the construction of the project shall be replaced at no cost to the Owner by a licensed land surveyor.
- 8.12 Temporary Utilities. The Contractor shall provide all temporary electrical, lighting, telephone, heating, cooling, ventilating, water, sanitary, fire protection, and other utilities and services necessary for the performance of the work. All fees, charges, and other costs associated therewith shall be paid for by the Contractor.

The Contract Plans show utility locations based on limited field observation and information provided to the Engineer by others. **The Engineer cannot guarantee their accuracy.** The Contractor shall immediately notify the Engineer of any discrepancies with utility locations as shown on the Contract Drawings and/or their bury depths that may in any way affect the intent of construction as scoped in these specifications.

There will be no separate payment for exploratory excavation required to locate underground utilities.

9. CONSTRUCTION SAFETY

The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees) and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and penalties set forth therein.

10. CONSTRUCTION LIMITS AND AREAS OF DISTURBANCE

- 10.1 Construction Limits. Where construction easements or property lines, are not specifically called out on the Plan Drawings, limit the construction disturbance to 10 feet when measured from the edge of the slope stake grading, or to the adjacent property line, whichever is less. Disturbance and equipment access beyond this limit is not allowed without the written approval of both the Engineer and the owner of the affected property. If so approved, disturbance beyond construction limits shall meet all requirements imposed by the landowner; this includes existing roads used and/or improved as well as the construction of new access roads. Special construction, reclamation, or post-construction road ripping or other closure provisions required by the landowner on access roads beyond the construction limits shall be performed by the Contractor at no additional cost to the Owner.
- 10.2 Areas of Disturbances. Approved areas of disturbance are those areas disturbed by construction activities within the construction limits and along designated or approved access routes. Such areas may require reclamation and revegetation operations, including grading to the original contours, top soiling with salvaged or imported topsoil, seeding, fertilizing, and mulching as specified herein. Other areas that are disturbed by the Contractor's activities outside of the limits noted above will be considered as site damage or unapproved areas of disturbance subject to Repair and Replacement Quality as specified in the General Conditions. This includes areas selected by the Contractor outside the defined construction limits for mobilization, offices, equipment, or material storage.

11. PROTECTION OF ADJACENT IMPROVMENTS

Retain and protect all adjacent improvements not called for removal on the drawings. Restore all damaged items to pre-existing condition.

12. TREE PROTECTION AND PRESERVATION

The Contractor and the Owner shall individually inspect all trees within the project construction limits prior to construction. The Owner shall determine which trees are to be removed and which trees are to be preserved. Construction of the grading, utilities and various roadway facilities must not, in the opinion of the Engineer, significantly damage the trees root system or hinder it's chances for survival. Reasonable variations from the plans, as determined by the Engineer, may be employed to ensure the survival of trees.

13. CONSTRUCTION SURVEYS

The Contractor will be responsible for all layout and construction staking utilizing the Engineer's existing control and coordinate data for the project. Dimensions and elevations indicated in layout of work shall be verified by the Contractor. Discrepancies between Drawings, Specifications, and existing conditions shall be referred to the Engineer for adjustment before work is performed. The Engineer may set location and grade stakes prior to construction;

however, it is ultimately the responsibility of the Contractor to check and verify all construction staking for the project.

Existing survey control (horizontal and vertical) has been set for use in the design and ultimately the construction of these improvements. A listing of the coordinates and vertical elevation for each of these control points may be included in the project drawings.

The Contractor will be responsible for preserving and protecting the survey control until proper referencing by the Contractor has been completed. Any survey control obliterated, removed, or otherwise lost during construction will be replaced at the Contractor's expense.

Contractor shall be aware of property pins and survey monuments. Damage to these pins will require replacement of such by a registered land surveyor at no cost to the owner.

The Contractor is responsible for the location and elevation of all the construction contemplated by the Contract Documents.

The Contractor shall provide construction staking from the Contractor's layouts and the control points. Contractor's construction staking includes at a minimum:

1. Slope stakes located at critical points as determined by the Engineer.
2. Blue tops every longitudinally and transversely for subgrade and crushed base to verify finish grading of course.
3. Location and grade stakes for drainage features and retaining walls.
4. Location stakes for roadside safety items, permanent and temporary traffic control, and misc. items as determined by the Engineer.

Prior to commencing work, the Contractor shall carefully compare and check all drawings, each with the other that in any way affects the location or elevation of the work to be executed by him, and should any discrepancy be found, he shall immediately report the same to the Engineer for verification and adjustment. Any duplication of work made necessary by failure or neglect on his part to comply with this function shall be done at his sole expense.

Original field notes, computations and other records take by the Contractor for the purpose of quantity and progress surveys shall be furnished promptly to the Engineer and shall be used to the extent necessary in determining the proper amount of payment due to the Contractor.

These field notes, computations and other records shall be neat and orderly. Field notes shall be complete and in a standard format approved by the Engineer. Unless waived in each specific case, all quantity surveys made by the Contractor shall be made under the direct supervision of the Engineer.

14. MATERIAL SOURCES AND CONSTRUCTION WATER

The Contractor shall be responsible for locating all necessary material sources, including aggregates, earthen borrow and water necessary to complete the work. The Contractor shall be responsible for meeting all transportation and environmental regulations as well as paying any royalties. The Contractor shall provide the Engineer with written approvals of landowners from whom materials are to be obtained prior to approval.

The Contractor may use materials from any source, providing the materials have been tested through representative samples and will meet the Specifications.

Water for compaction efforts shall be supplied by the Contractor.

15. MATERIALS SALVAGE AND DISPOSAL

If the Owner requests to salvage material removed from the project, notify the Owner within 24 hours prior to delivery at a specific location approved by the Owner.

Haul and waste all excavated material to a legal site and obey all state, county, and local disposal restrictions and regulations.

16. STORED MATERIALS

Contractor shall use an approved storage area for materials. Materials and/or equipment purchased by the Contractor may be paid for on a monthly basis providing invoices for said materials and equipment are presented to the Engineer, and such materials have been approved through the submittal process are stored and insured.

17. STAGING AND STOCKPILING AREA

Contractor shall use staging and stockpiling sites for temporary traffic control devices and equipment as approved by the Owner. Contract drawings may show approved staging and stockpiling locations. Notify Owner within 24 hours for approval of staging and stockpiling sites not shown on the contract drawings.

18. SECURITY

The Contractor shall provide all security measures necessary to assure the protection of equipment, materials in storage, completed work, and the project in general.

19. CLEANUP

Cleanup for each item of work shall be fully completed and accepted before the item is considered final. If the Contractor fails to perform cleanup within a timely manner the Owner

reserves the right to shut down construction activities.

20. ACCESS DURING CONSTRUCTION

Provide access to all public and private roadways and approaches along the project throughout the construction period.

21. CONSTRUCTION TRAFFIC CONTROL

The contractor is responsible for providing safe construction and work zones within the project limits by implementing the rules, regulations, and practices of the Manual on Uniform Traffic Control Devices, current edition.

22. SANITARY FACILITIES

On-site toilet facilities for employees of Contractor and Subcontractors shall be provided and maintained in a sanitary condition.

23. RECORD DRAWINGS

The Contractor's Superintendent shall maintain at the project site, a "Record Set of Drawings" showing field changes, as-built elevations, unusual conditions encountered during construction, and such other data as required to provide the Owner with an accurate "as constructed" set of record drawings. The Contractor shall furnish the "Record Set" to the Engineer following the Final Inspection of the Project.

The Contractor's final estimate and final payment will not be processed until the "Record Set" of drawings are received and approved by the Engineer.

24. PROPOSAL ITEM DESCRIPTIONS AND ESTIMATED QUANTITIES

1. Mobilization/Demobilization:
 - * Description: This bid item includes all equipment, labor and associated work necessary for the transporting of equipment to and from the work site to construct the project to the lines and grades as noted in the specifications and drawings.
2. Roadway Reconditioning:
 - * Description: This bid item includes all equipment, labor and associated work for the reconditioning an existing roadbed to the lines and grades as noted in the specifications and drawings.
 - * Estimated Quantity:
 - 6,970 linear feet
3. Cleaning Existing Culverts:
 - * Description: This bid item includes all equipment, labor and associated work for

the cleaning of existing culverts to the lines and grades as noted in the specifications and drawings.

* Estimated Quantity:

- 12 each

4. 12" CMP Culvert Installation (2 2/3" x 1/2" corrugations, 16 gage):

* Description: This bid item includes all equipment, labor and associated work for the installation of a new corrugated metal pipe (culvert) to the lines and grades as noted in the specifications and drawings.

* Estimated Quantity:

- 240 linear feet

5. Culvert Outlet Energy Dissipators:

* Description: This bid item includes all equipment, labor and associated work for the placement, of earthwork geotextile fabric and riprap to the lines and grades as noted in the specifications and drawings.

* Estimated Quantity:

- 48 square yards (based on 18" riprap depth)

6. Water Deflectors:

* Description: This bid item includes all equipment, labor and associated work for the placement, grading, and installation of rubber conveyor belt water deflectors to the lines and grades as noted in the specifications and drawings.

* Estimated Quantity:

- 8 each

7. Gravel Check Dams:

* Description: This bid item includes all equipment, labor and associated work for the placement of crushed base course material check dams to the lines and grades as noted in the specifications and drawings.

* Estimated Quantity:

- 100 each

8. 1 1/2" Minus Crushed Base Course:

* Description: This bid item includes all equipment, labor and associated work for the placement, grading, and compaction of crushed base course material to the lines and grades as noted in the specifications and drawings.

* Estimated Quantity:

- 9,740 square yards (4" compacted depth)

SPECIFICATIONS FOR WORK

TECHNICAL PROVISIONS

Incorporation of Montana Public Works Technical Specifications.

The Technical Specifications as found in Montana Public Works Standard Specifications (MPWSS), Sixth Edition, April 2010 and/or current Addendums or Revisions; are hereby incorporated by reference and made a part of this Contract:

Incorporation of Montana Fish, Wildlife & Parks Technical Specifications and Modifications to MPW Technical Specifications.

In addition to the MPWSS Technical Specifications are the following Montana Fish, Wildlife & Parks Technical Specifications (modifications to MPWSS Technical Specifications).

SECTION 01050 -	Field Engineering
SECTION 01450 -	Mobilization/Demobilization
SECTION 01750 -	Final Cleanup
SECTION 01800 -	Erosion and Sediment Control
SECTION 02110 -	Geotextiles
SECTION 02232 -	Roadway Reconditioning
SECTION 02233 -	Water Deflectors
SECTION 02235 -	Crushed Base Course
SECTION 02236 -	Gravel Check Dams
SECTION 02242 -	Culvert Outlet Energy Dissipators

SECTION 01050

FIELD ENGINEERING

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

PART 3 EXECUTION

1.1 CONSTRUCTION SURVEY

- A. Perform all survey, staking, recording of data, and calculations as necessary to construct the project from the initial layout to final completion. Reset stakes as many times as necessary to construct the work.
- B. Set base course grade stakes at 50' intervals on tangent sections and at 25' on horizontal curves. Limit grade stake tolerances to $\pm 0.04'$.
- C. Set culvert grade stakes and culvert energy outlet dissipater location grade stakes. New culvert location stakes will be set by the Project Representative.

PART 4 MEASUREMENT AND PAYMENT

Add the following:

- A. Construction Surveying will not be measured and is considered incidental to other work items in this Contract.

END OF SECTION 01050

SECTION 01450

MOBILIZATION/DEMOBILIZATION

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This item shall consist of the preparatory work and operations necessary performed by the Contractor for the movement of personnel, equipment, supplies, and incidentals to and from the work site. The work includes those actions necessary for obtaining necessary permits required for mobilization; for the establishment of all offices and facilities necessary to work on the project; for premiums on contract bonds; for insurance for the contract; and for other work on the various items on the project site. Mobilization costs for subcontracted work shall be considered to be included.
- B. Contractor's cost for administration, bonding, insurance, and site documents shall be included in mobilization and shall not be paid as a separate item.
- C. All equipment moved to the project sites shall be in good mechanical condition and free of fuel, oil, lubrication, or other fuel leaks. The Contractor shall immediately remove any equipment potentially or actually discharging environmentally damaging fluids.
- D. All equipment moved to the project sites shall be thoroughly cleaned before it is brought to the sites to prevent the introduction of weed seeds. Equipment removed from the sites may not be returned to the sites again until it is thoroughly cleaned again.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. There will be no direct measurement of this item.

4.2 PAYMENT

- B. Partial payments for mobilization/demobilization will be made based on the lump sum bid price as follows:

- 50% of the amount bid for mobilization/demobilization when the Contractor has moved on-site and begun construction activities.
- 100% of the amount bid for mobilization/demobilization when all construction activities are complete and all construction equipment removed.

END OF SECTION 01450

SECTION 01750

FINAL CLEANUP

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of final cleanup of the project site prior to final acceptance.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CONTRACTOR RESPONSIBILITIES

The contractor shall be responsible for final clean up at the end of the project to a level satisfactory to the owner. All construction debris, no matter how small, shall be collected and removed from the site. All wheel ruts shall be filled in and be leveled to match the adjacent grade and material. Re-seeding or re-sodding, or other re-surfacing may be necessary to repair any construction related impacts or damage.

All survey markings, stakes, temporary paint marks, flagging and other devices shall be removed regardless of who installed them. All excess pavement, concrete, gravel, soil, or other construction materials not intended for permanent use shall be removed.

All final slopes shall be dressed manually to remove woody debris, accumulated trash and oversized material. Any new slope or topsoil surfaces shall be hand raked to provide a uniform appearance. The contractor shall dress all gravel, pavement and concrete edges to eliminate abrupt edges and provide a smooth transition. All construction related temporary sediment control devices shall be removed as soon as practical.

PART 4 MEASUREMENT AND PAYMENT

4.1 PAYMENT

Unless specifically noted otherwise, all final cleanup work shall be incidental to other work items in the contract and no separate payment shall be made.

END OF SECTION 01750

SECTION 01800

EROSION AND SEDIMENT CONTROL

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of furnishing, constructing, and maintaining permanent and temporary erosion control and sediment control measures as designated on the project drawings or by the Project Representative.

PART 2 PRODUCTS

2.1 GENERAL

- A. Temporary and erosion control products utilized include but are not limited to backfill material; berms; brush barriers; erosion control bales, wattles, logs, rolls; erosion control culvert pipe; detention basins; fertilizer; geotextile; mulch; plastic lining; riprap; sandbags; seed; silt fence; and water.

2.2 SEDIMENT RETENTION

- A. Where called out in the plans, provide a sediment retention product made from straw and coconut fiber reinforced with a 100% bio-degradable netting. Use wood stakes to secure sediment retention product in place, spacing per the manufacturer's recommendations. An acceptable product is *Sediment Stop*, manufactured by *North American Green*, or approved equal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction according to the contract erosion control plan, environmental permits, and as directed by the Engineer. These erosion control measures shall be designed, implemented, and maintained by the Contractor in accordance with Best Management Practices (BMPs) to control erosion and sediment release from the work site.
- B. Install permanent and temporary erosion control measures according to the Contractor's Storm Water Pollution Prevention Plan (if applicable).

- C. When erosion control measures are not functioning as intended, immediately take corrective action.

PART 4 MEASUREMENT AND PAYMENT

4.1 PAYMENT

- A. All items in this section are incidental to the work and no separate payment is made for these items.

END OF SECTION 01800

SECTION 02110

GEOTEXTILES

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

PART 1 GENERAL

1.1 DESCRIPTION

Add the following:

This work also includes the installation of high-survivability, non-woven geotextile on beneath riprap rock placement.

1.2 REFERENCES

C. Delete this section and add the following:

Provide geotextile meeting the strength requirements from Table 1.

Table 1. High Survivability, Non-Woven Geotextile Requirements

	TEST METHODS	UNITS	REQUIREMENTS
Grab Elongation	ASTM D 4632	%	>50
Grab Strength	ASTM D 4632	lbs	>200
Sewn Seam Strength	ASTM D 4632	lbs	>180
Tear Strength	ASTM D 4533	lbs	>80
Puncture Strength	ASTM D 4833	lbs	>80
Permittivity	ASTM D 4491	Sec ⁻¹	≥0.02
Apparent Opening Size	ASTM D 4751	Sieve Size (in)	#30 (≤0.024)
Ultraviolet Stability (Retained Strength)	ASTM D 4355	%	≥50 after 500 hours of exposure

END OF SECTION 02110

SECTION 02232
ROADWAY RECONDITIONING

Added Subsection:

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of reconditioning roadways by linear grading, reshaping, and drainage ditch rehabilitation, and drainage improvements as designated on the project drawings or as directed by the Project Representative.

PART 2 EXECUTION

2.1 ROADWAY RECONDITIONING

Recondition the roadway by performing linear grading operations to crown, or cross slope the roadway to drain as shown on the project drawings. Blade roadway shoulder and ditch slopes to assist drainage and salvage roadway surfacing material. Do not place topsoil on the roadway surface from linear grading operations.

Conserve excavation from roadway reconditioning construction to remedy perched culvert areas. Backfill and compact embankment for any perched culvert scheduled for cleaning and/or culvert outlet energy dissipators.

2.2 CLEANING CULVERTS

Clean all cross drain and approach drainage culvert inlets and outlets as part of the roadway reconditioning operations. Remove all debris, sediment, and obstructions and re-establish flow line at culvert inlet/outlet invert.

Flush each culvert with water to remove all sediment accumulated inside. Project Representative will inspect inside each culvert scheduled for cleaning.

PART 3 MEASUREMENT AND PAYMENT

3.1 METHOD OF MEASUREMENT AND PAYMENT

Roadway reconditioning will be measured and paid for by the linear foot (LNFT). Cleaning culverts will be measured and paid for by the each (EACH).

END OF SECTION 02232

SECTION 02233

WATER DEFLECTORS

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of installing water deflector components to the lines and grades as designated in the project drawings and specifications or as directed by the Project Representative.

PART 2 PRODUCTS

2.1 FRAMING

- A. Furnish treated 2"x6" lumber planks (two planks for each deflector).

2.2 RUBBER

- A. Furnish 3/8" thick by 11" wide standard-grade rubber (used conveyor rubber belt acceptable) for each installation.

2.3 HARDWARE

- A. Furnish 4 inch galvanized screws.

PART 3 EXECUTION

3.1 INSTALLATION

- A. After base course placement compaction construction, excavate an 8" trench across the roadway at the angle shown in the project drawings. Space deflector trenches as indicated on the project drawings. Locations of each trench may be modified by the Project Representative.
- B. Secure rubber between treated planks by fastening with galvanized screws on both sides. Utilize two (2) screws, spaced every 4', as shown in the project drawings. Stagger screw spacing with regard to each side.
- C. Expose 3" (minimum) of rubber water deflector above finished road surface.
- D. Backfill and compact with conserved base course material on both sides of the deflector.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

Water Deflectors will be measured and paid by the each (EACH).

END OF SECTION 02233

SECTION 02235

CRUSHED BASE COURSE

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

PART 2 PRODUCTS

2.3 GRADATION

Delete the entire section and replace with the following:

- E. The liquid limit for that portion of the fine aggregate passing a No. 40 sieve cannot exceed 25, and the plasticity index cannot be below 3 or exceed 6, as determined by AASHTO T89 and T90.

3.3 FIELD DENSITY REQUIREMENTS

Add the following:

- D. The Owner will provide all compaction testing by an independent testing agency.
- E. Compaction testing locations and frequency will be performed as follows:

Compaction Testing	Location*	Frequency
Subgrade	None**	None**
Crushed Base Course	WMA Entrance Road	5

* Station/Offset determined by Engineer

**Proof roll subgrade only for observation by Engineer prior to base course placement.

END OF SECTION 02235

SECTION 02236

GRAVEL CHECK DAMS

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of installing gravel check dams in roadside ditches to the lines and grades as designated in the project drawings and specifications or as directed by the Project Representative.

PART 2 PRODUCTS

- 2.1 Crushed Gravel - See Section 02235

PART 3 EXECUTION

3.1 INSTALLATION

- A. After roadway reconditioning construction, place crushed base course as shown in the project drawings. Space gravel check dams as indicated on the project drawings, and no less than every 50' of linear ditch. Locations of each gravel check dam may be modified by the Project Representative.
- B. Assure gravel check dam spans the reconditioned ditch section (4 feet minimum). Maintain a 4" elevation difference between top of gravel check dam and top of finished road surface.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

Gravel check dams will be measured and paid by the each (EACH).

END OF SECTION 02236

SECTION 02242

CULVERT OUTLET ENERGY DISSIPATORS

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of conserving and/or furnishing, placing, and finishing riprap rock placement over geotextile fabric at designated areas on the project drawings or as directed by the Project Representative.

PART 2 PRODUCTS

2.1 GEOTEXTILES – see Section 02110

2.2 RIPRAP GRADATION

- A. Furnish hard, durable, angular rock that is resistant to weathering and water action and free of organic or other unsuitable material. Do not use shale, rock with shale seams, or other fissile or fissured rock that may break into smaller pieces in the process of handling and placing. Incorporate the following gradation for riprap installations as shown in Table 1:

Table 1. Riprap Gradation

Percent of Rock by Mass	Approximate Cubic Dimension (inches)
70	6 to 15
30	0 to 6

PART 3 EXECUTION

3.1 GENERAL

- A. Place riprap to form a well-graded mass to its full thickness in operation to avoid displacing the underlying geotextile or other material. Do not place riprap material by methods that cause segregation or damage to the prepared surface. Place or rearrange individual rocks by mechanical or hand methods to obtain a dense uniform blanket with a reasonably smooth surface.
- B. Install conserved and/or imported riprap according to the project drawings or as directed by the Project Representative.

PART 4 MEASUREMENT AND PAYMENT

4.1 GENERAL

- A. Culvert Outlet Energy Dissipators including geotextile fabric and riprap will be measured and paid by the square yard (SQYD).

END OF SECTION 02242